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Miranda v. Navistar

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Dear Mr. Turley,

At your request, the following is a report summarizing my opinions that I will offer in the litigation referenced above. This report details my opinions to date, the facts and data that I have considered in forming said opinions, and the basis and reasons for my opinions. My rate is $250 per hour. Additionally, attached as exhibits to this report are the following: (1) my curriculum vitae (CV), which details my knowledge, skill, experience, training, and education in the fields of engineering, and vehicle design analysis of electronic components. (2) a list of other cases in which, during the previous four (4) years, I have testified as an expert at trial or by deposition;

I. Background, Qualification and Methodology

A. I received a Bachelor's Degree in Applied Science Electronic Engineering Technology (1996) ITT Technical Institute; San Diego, California

B. My curriculum vita, which is Attachment (1), shows my background in Electronic design, design analysis and development engineering. I also have experience with integrated circuit design and product creation process within large organizations, including Cypress Semiconductor.

C. My opinions in the Miranda v Navistar - matter are based on my background, experience, education and training in the field of Electronic/Automotive Engineering, and on the application of recognized laws of physics and principles of electrical and automotive engineering to the specific issues raised by the accident that is the topic of this report.

D. While employed by a variety of Electronic Manufacturers I have been responsible for and participated at various levels in the design, analysis, testing and development of almost every electronics system, including printed circuit boards. Indeed, my expertise includes the field of electronics design analysis engineering – the specialty of analyzing the design and performance of electronics. I have been

Exhibit A

responsible for analyzing electronics in a variety of field performances. Including automotive noise vibration and harshness testing.

II. Design Experience

A. I have over 20 years of experience, training and education as an electronics engineer. Most of this experience has been in the design, development and analysis of many types of electronic systems. I have worked directly for two automotive manufacturers. In addition, I have worked for numerous electronic manufacturers in the specific area of automotive modules and harnesses.

B. I was a Staff Electrical Engineer at Aptera Motors. I was the inhouse printed circuit board and harness expert. In this role I was responsible for all aspects of onboard electronics on the Aptera. This included drafting and approving the plan for all safety testing (vehicle, sled and component testing). I was the architect for the system level design of the 12V power distribution system and electronic vehicle communications system. This system was used in the Aptera EV1, 2E and 2H models. I also was responsible for NVH testing of the vehicle as it related to printed circuit boards and harnesses.

C. While I was a Staff Electrical Engineer at Green Tech Automotive, Inc. I designed and developed the Power distribution system and the complete onboard electronic system. I was responsible for the design of the MyCar Li model and the MyCar L model.

D. In a contractor capacity through Modelo Automotive. I did the design and development of all exterior lighting printed circuit boards and harnesses for Coda Automotive, for the model Hafei Saeboa EV. I similarly designed the forward exterior lighting electrical system and harnesses for the Tesla Automotive, Model S.

E. It has been part of my background and training to:

1. Utilize general electronic engineering knowledge and skills, including numerous principles of electronics of the and their application to the operation of electronic systems and components.

2. Utilize special knowledge of electrical engineering, including knowledge of principles of electrical engineering, as applied to the design, manufacture and performance of automobiles and component parts.

3. Utilize special background and training in principles of design and analysis of design of automotive electrical systems and the performance of automotive control modules and wire harnesses:

   a. In the testing environment;
   b. In studying the relationship between testing and "real world/ field" performance based on testing and analysis of testing; and
   c. In actual "real world" conditions.

III. Assignment and Methodology

A. I was asked to perform an analysis of the Navistar rear emergency exit door and emergency door locking system in the Navistar bus design.

B. The assignment was accomplished using methods commonly accepted and used by automotive engineers who are similarly engaged in the profession of system design failure analysis.

C. I began this analysis by reviewing the Edinburg Police Departments Detail report. I also reviewed the Hidalgo County Sheriff's Office Deputy Report for Incident 16-46672. This allowed me to further develop an understanding of the performance of the Navistar bus. I followed an engineering method often used in my background and training to perform this analysis and considered the following.

1. A review of technical drawings and specifications.
2. A review of testing and reports of testing by Navistar.
3. A review of deposition testimony of Navistar employees taken in this litigation.
4. A review of the complaint in this litigation.

IV. Analysis and Discussion

The ability to open the unlocked rear door at freeway speeds is the causal flaw in the Navistar design. Rather than safeguard this door at freeway speeds, the Navistar system allows for the door to be opened by any force capable of releasing the latch mechanism.

A. While implementation of a lock/unlock system could be done a number of ways, the simplest is taking the real-time speed signal from the bus and adding a simple circuit to drive the lock mechanism. This design would be just the lock mechanism and completely separate from the latch mechanism. The early patents on this type of design that locked and unlocked at 3 mph started in 1972.

B. Similar designs are already in service on buses under European Regulation. These designs were readily available in Europe as early as 2007. These modern designs provide a speed signal to a circuit that drives an electromagnetic lock that is powered and activated. Or in some cases a pneumatic bolt is activated. This lock/bolt depending on the particular solution deployed by the manufacturer engages (locks) above 3 mph and disengages (unlocks) below 3 mph.

C. Further a more intelligent design would be a smart door, with its own independent speed monitoring. This could use combinations of accelerometers, inclinators, gyroscope and GPS to provide an intelligent door that unlocks only at safe speed conditions, such as a rollover, wheel slippage and other unforeseen forces applied to the system.

However, compared to these solutions the subject Navistar system architecture is insufficient. It was designed to allow for the emergency door to open at freeway speeds. Not only was this causal to this incident, this design has rapidly been improved by other manufacturers and not just in the bus industry. London's taxis use a simple speed sensor and then a notification of brake release allowing for rear car door opening. This shows how other manufacturers have surpassed Navistar in design and safety features.

As designed the Navistar Inc. rear emergency exit door will always open at freeway speeds. There is no safety feature other then the mechanical lever unlatching, to prevent an occupant from opening this door at freeway speeds. A simple addition of a circuit to detect a freeway speed and lock the door is a reasonable addition to directly address the cause in this incident.

V. Conclusions

A. Navistar knew the door could be open at freeway speeds. This capability was in their design on purpose.

B. The design could have been better in 2010. As early as 2007 at least 4 EU bus companies had designed buses with service and emergency doors that lock automatically above 5 km/h (3.1mph). These designs also included unlock below 5 km/h (3.1mph), to ensure the emergency door mechanism is deactivated.

C. From an automotive technical standpoint the technical ability to lock/unlock doors based on physical speed had been around for decades.

D. Navistar made no technical effort in their design to address the unlocked rear emergency door at freeway speeds.

E. It was technologically and economically feasible for Navistar to have installed the above described three safer alternative designs, at the time the subject vehicle was sold.

Note: This report is preliminary and is subject to amendment and supplementation pending a review of documents that may be produced by the defendant in this matter, and a review of reports by defense experts in this matter, or any other new information.

The opinions and conclusions expressed above are based upon a reasonable degree of automotive and electronic engineering certainty.

Sincerely,

Rob Berriman

Attachments:

A. Rob Berriman curriculum vita and depo list